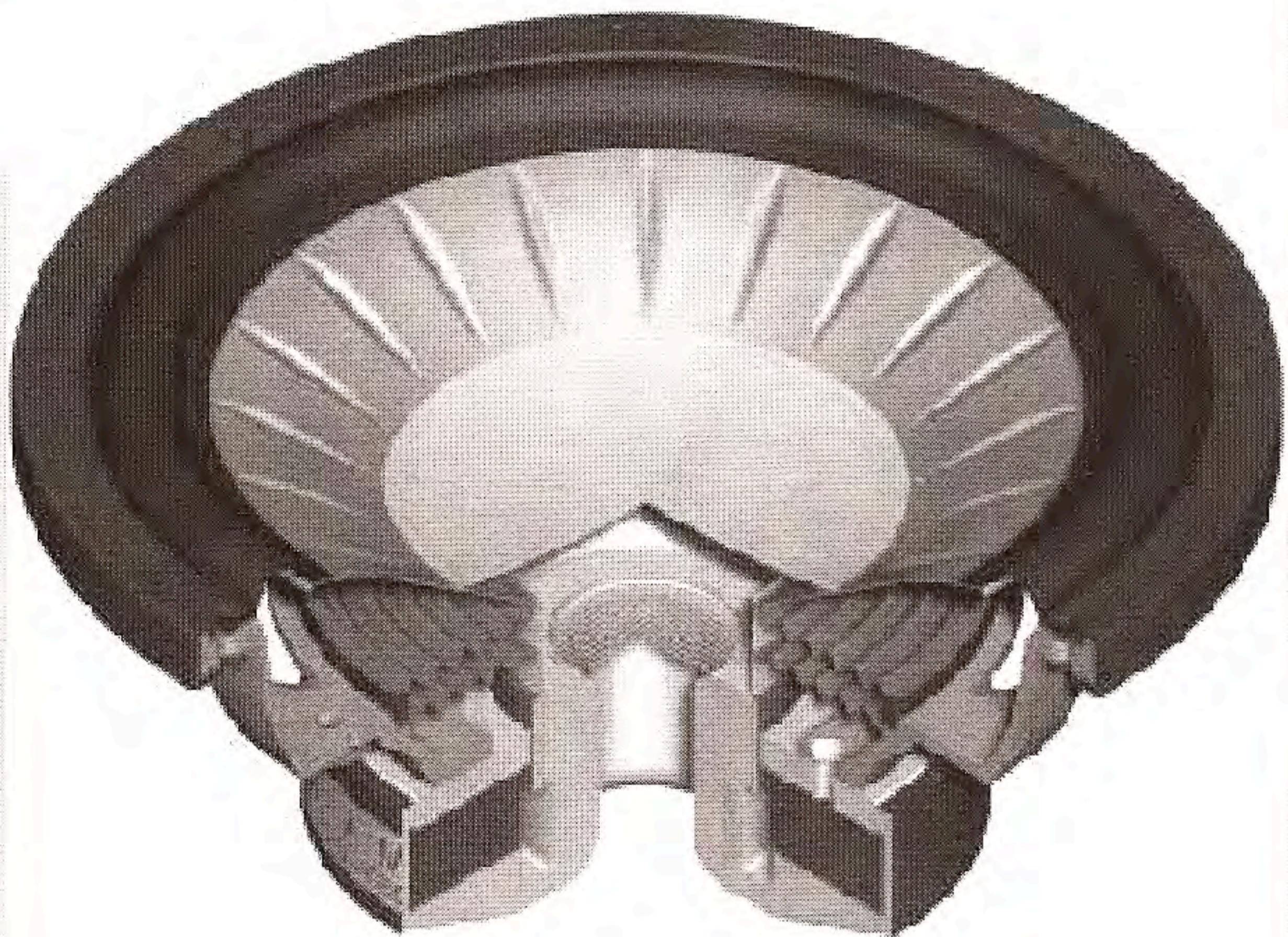


**DIAMOND™**  
AUDIO TECHNOLOGY



**M5 SUBWOOFER  
OWNER'S MANUAL**

M5102.4 - M5102.8  
M5122.4 - M5122.8

<http://www.diamondaudio.com>

## FEATURES

**Mag Alloy Cone** - Magnesium & aluminum alloy, high rigidity, linear response

**Die-cast Alloy Chassis** - High strength maintains critical parts alignment

**Santoprene® Rubber Surround** - Durable at environmental extremes. Large roll allows long stroke

**Machined Backplate/Pole** - Precision engineered to exacting tolerance

**Aluminum VC Former** - 400% stronger than Kapton®, excellent heat transfer

**3" Dia. Pure Copper Coil** - 4-layer design. High thermal/current capacity for highest power handling.

**Mirror Image Dual Nomex® Spiders** -Enormous controlled excursion, high durability

**Interior Chamber & Pole Venting** - Forced cool air surrounds the VC.

**3-Year Warranty** - If purchased from and installed by an Authorized Diamond Retailer.

## INSTALLATION

The installations and enclosures shown in this manual are offered as a suggestion only. Since enclosure design is as important to sound quality as the speaker itself, it is recommended that your Authorized Diamond Retailer assist you in designing and building an enclosure to suit your vehicle. For more information on selecting the best subwoofer enclosure, consult the "questions and comments" page of our web site, [www.diamondaudio.com](http://www.diamondaudio.com)

## RECOMMENDED ENCLOSURES

Diamond's M5 Series subwoofers are primarily designed for use with **small sealed enclosures**. Good results have also been achieved in vented and bandpass enclosures. Although "free-air" (infinite-baffle) applications are NOT recommended, they may be used successfully in low-power systems (e.g., 75W or less per sub).

**HIGH PASS ("SUBSONIC") FILTERS MUST BE USED WITH NON-SEALED APPLICATIONS TO PREVENT OVER-EXCURSION AT INFRASONIC FREQUENCIES.**

The enclosure volumes shown below are **NET INTERNAL VOLUMES**. Driver, vent and brace displacement must be taken into account when designing your enclosure.

### M5102 (10") SINGLE DRIVER ENCLOSURES

BOX TYPE	NET VOLUME		VENT (diameter x length)		TUNING	POWER
	(Liters)	(Cubic Feet)	(mm)	(inches)	(Hz)	continuous(W)
Sealed (small)	14	0.5	n/a	n/a	n/a	350
Sealed (large)	25□	0.88□	n/a	n/a	n/a	300□
Vented (small)	19.3□	0.68	63 x 400	2.5" x 15.75"	35	350□
Vented (large)	26□	0.92□	63 x 248□	2.5" x 9.75"□	35□	300□
Bandpass (small)	15s/23v□	0.53s/0.8v□	(2) 100 x 356	(2) 4.0" x 14"	73□	350□
Bandpass (large)	21s/28v	0.73s/0.98v	(2) 100 x 394	(2) 4.0" x 15.5"	63	300

### M5122 (12") SINGLE DRIVER ENCLOSURES

BOX TYPE	NET VOLUME		VENT (diameter x length)		TUNING	POWER
	(Liters)	(Cubic Feet)	(mm)	(inches)	(Hz)	continuous(W)
Sealed (small)	17□	0.6□	n/a	n/a	n/a	400□
Sealed (large)	28□	1.0	n/a	n/a	n/a	400□
Vented (small)	28□	0.98	75 x 375□	3.0" x 14.7"□	35	400□
Vented (large)	34□	1.2□	75 x 380	3.0" x 15"	30□	400□
Bandpass (small)	19s/26.3v□	0.67s/0.93v□	152 x 203	6.0" x 8.0"	78□	400□
Bandpass (large)	27.5s/38v	0.97s/1.3v	152 x 222	6.0" x 8.75"	62	400

# M5102.4 TEN INCH SUBWOOFER



## SEALED ENCLOSURE SPECIFICATIONS

FOR VENTED AND BANDPASS ENCLOSURE SPECS, CALL DIAMOND TECH SUPPORT, 1 - 888 222 9439

Diamond's M5 series woofers are optimized for small sealed enclosures, and will yield extended frequency response in a variety of sealed boxes. The main determining factor in the box size should be the amount of power applied - the more power, the smaller the box.

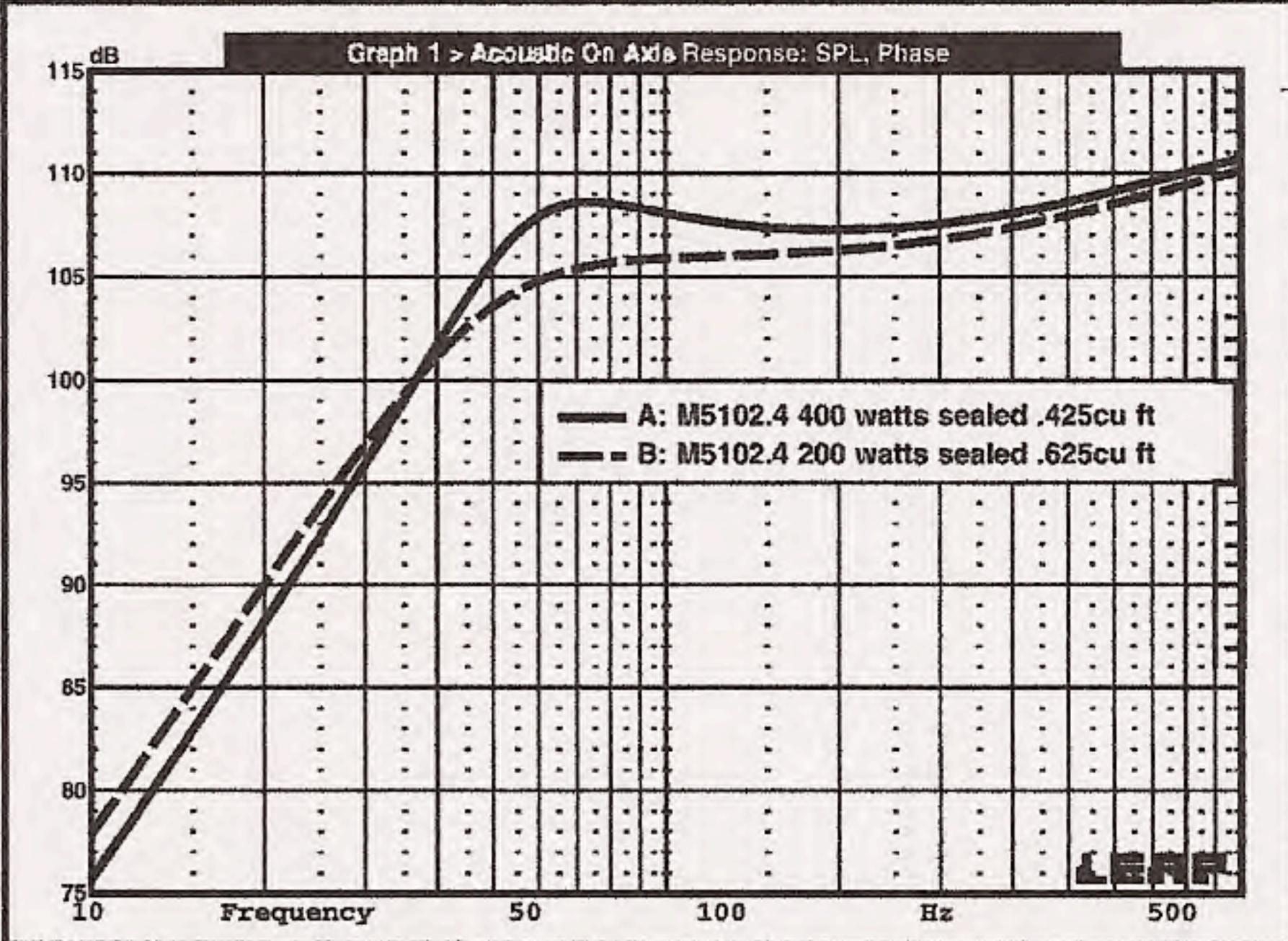
The large voice coil and higher moving mass allow this woofer to perform exceptionally well in high power, small sealed applications

(with some trade off of efficiency compared to small voice coil, larger box subwoofers). We feel we have developed the most musical small sealed subwoofers on the market. With a properly built box and the right power you will enjoy superior sound quality for years to come.

**System A** (400watts, smaller) handles more power. It has a slightly higher  $Q_{tc}=.55$  (a bit more bump) and yields about 3db more output making it the better choice for Rap and Rock.

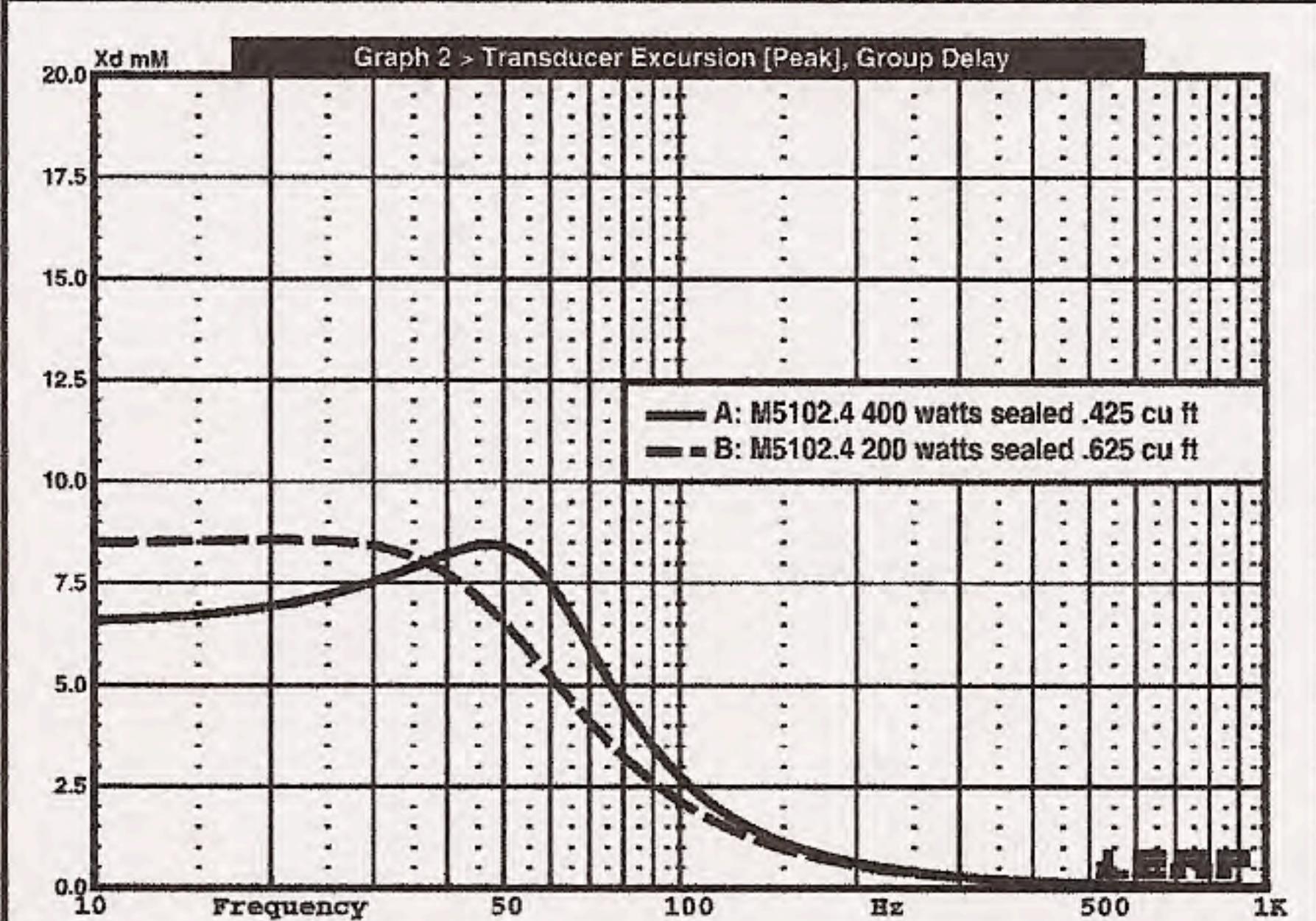
**System B** (200watts, larger) handles less power. Its  $Q_{tc}=.475$  (flatter response) is better suited to Classical music and Jazz.

### GRAPH 1 - SPL



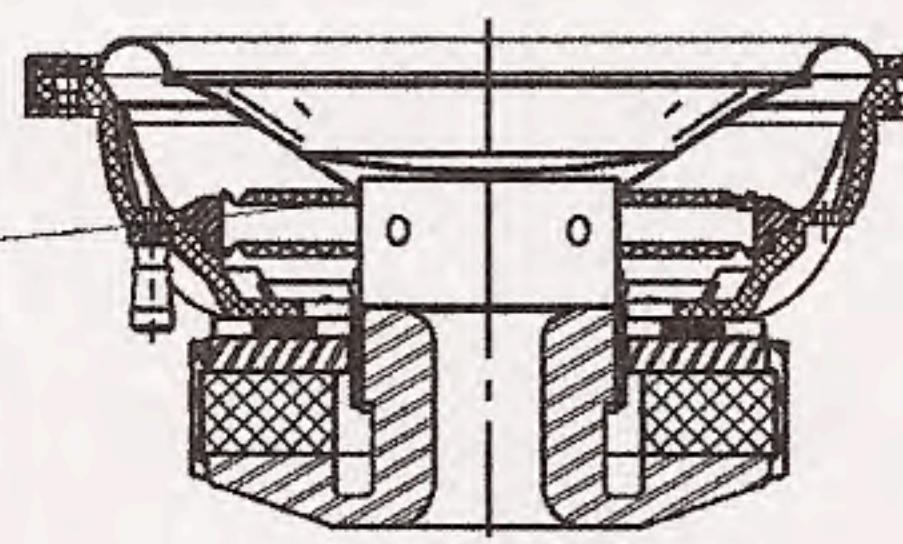
Graph 1: System A (400w, 0.43 cu. ft. gross) and System B (200w, 0.63 cu.ft.gross) are at the large and small extremes of our recommended box sizes but still have similar frequency response curves. The main point is to adjust box size to amplifier power so that BOTH higher and lower powered systems reach the same safe operating peak X-max. (see Graph 2)

### GRAPH 2 - X-MAX



## THIELE/SMALL PARAMETERS

Parameter	Value	Unit
$F_s$	32	Hz
$V_{as}$	22.6	Liter
$C_{ms}$	0.129	mm/N
$X_{max}$	9	mm
$X_{mech}$	10.35	mm
$S_d$	0.035	$m^2$
$R_e$	3	ohms
$Z$	4	ohms
$P_e$	400	Watts
$Q_{ts}$	0.333	
$Q_{no}$	0.204	%
$SPL@1W$	85.3	dB
$SPL@2.83V$	89.56	dB



### CHOOSING BOX VOLUME

Use your amplifier's rated output at the impedance represented by your subwoofer configuration to find the ideal gross enclosure volume on the chart below.

POWER APPLIED	IDEAL POWER RANGE	GROSS VOLUME
450w		0.38Ft <sup>3</sup>
400w		0.43Ft <sup>3</sup>
350w		0.48Ft <sup>3</sup>
300w		0.53Ft <sup>3</sup>
250w		0.58Ft <sup>3</sup>
200w		0.63Ft <sup>3</sup>
150w		0.68Ft <sup>3</sup>
100w		0.73Ft <sup>3</sup>

## SYSTEM A 400W - 0.43Ft<sup>3</sup>

- High power
- Better choice for Rap, Rock, and SPL

$V_b$	0.43	Ft <sup>3</sup> (gross)
Driver Disp.	0.128	Ft <sup>3</sup>
Net $V_b$	0.302	Ft <sup>3</sup> (net)
$Q_{tc}$	0.55	
$Q_L$	7	
$F_3$	45	Hz

Loosely fill 60%

Material - 3/4" MDF  
External Dimensions (motor in box)  
12" x 11" x 8.9  
Internal Dimensions  
10.5" x 9.5" x 7.4"

## SYSTEM B 200W - 0.63FT<sup>3</sup>

- Less power, lower, flatter response
- Better choice for Classical, Jazz, and Sound Quality

$V_b$	0.63	Ft <sup>3</sup> (gross)
Driver Disp.	0.128	Ft <sup>3</sup>
Net $V_b$	0.502	Ft <sup>3</sup> (net)
$Q_{tc}$	0.475	
$Q_L$	7	
$F_3$	47.5	Hz

Loosely fill 60%

Material - 3/4" MDF  
External Dimensions (motor in box)  
12.5" x 11.5" x 11.1"  
Internal Dimensions  
11" x 10" x 9.6"

# M5122.4 TWELVE INCH SUBWOOFER



## SEALED ENCLOSURE SPECIFICATIONS

FOR VENTED AND BANDPASS ENCLOSURE SPECS, CALL DIAMOND TECH SUPPORT, 1 - 888 222 9439

**DIAMOND™**  
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Diamond's M5 series woofers are optimized for small sealed enclosures, and will yield extended frequency response in a variety of sealed boxes. The main determining factor in the box size should be the amount of power applied - the more power, the smaller the box.

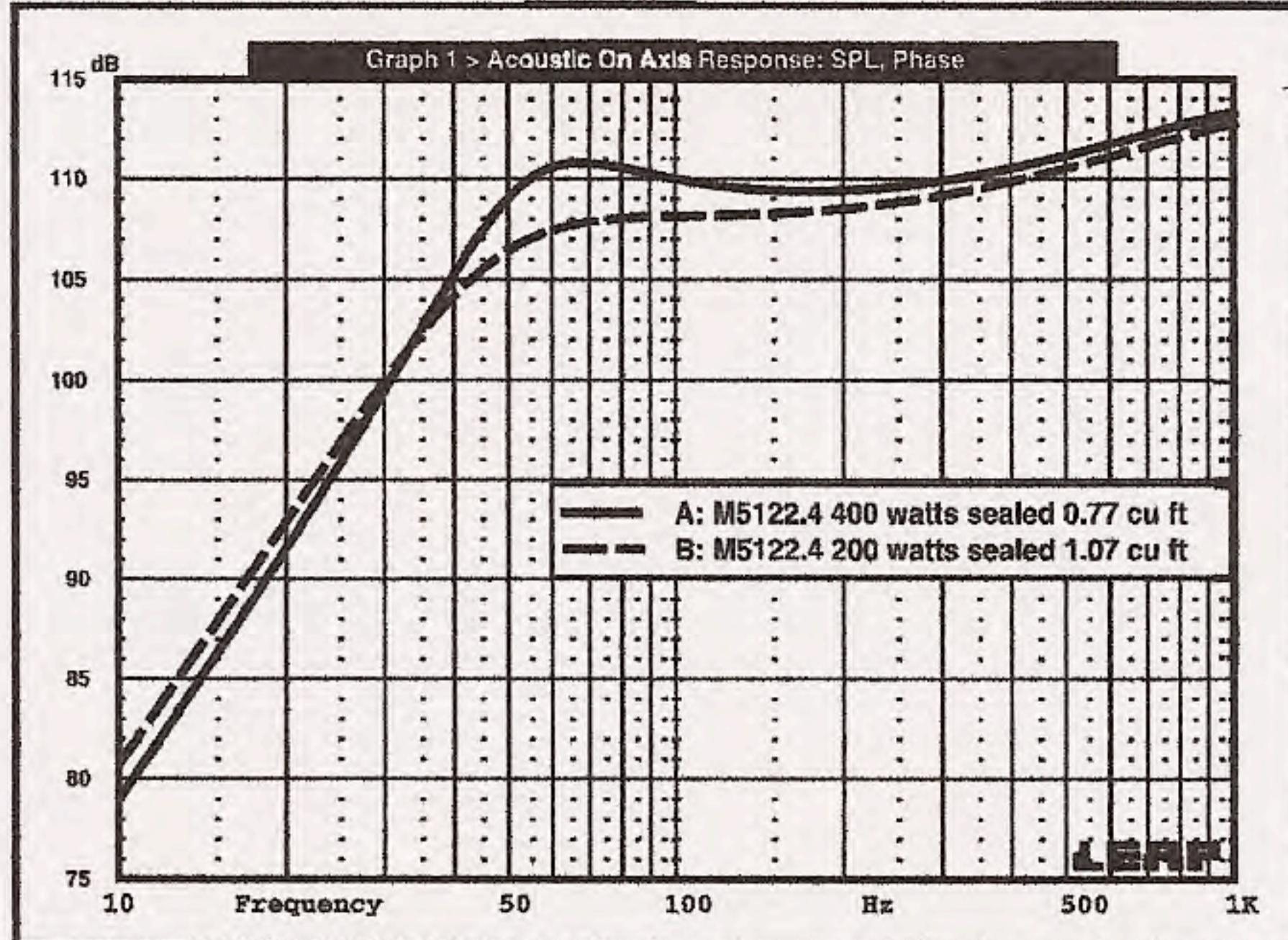
The large voice coil and higher moving mass allow this woofer to perform exceptionally well in high power, small sealed applications

(with some trade off of efficiency compared to small voice coil, larger box subwoofers). We feel we have developed the most musical small sealed subwoofers on the market. With a properly built box and the right power you will enjoy superior sound quality for years to come.

**System A** (400watts, smaller) handles more power. It has a slightly higher  $Q_{tc}=.55$  (a bit more bump) and yields about 3db more output making it the better choice for Rap and Rock.

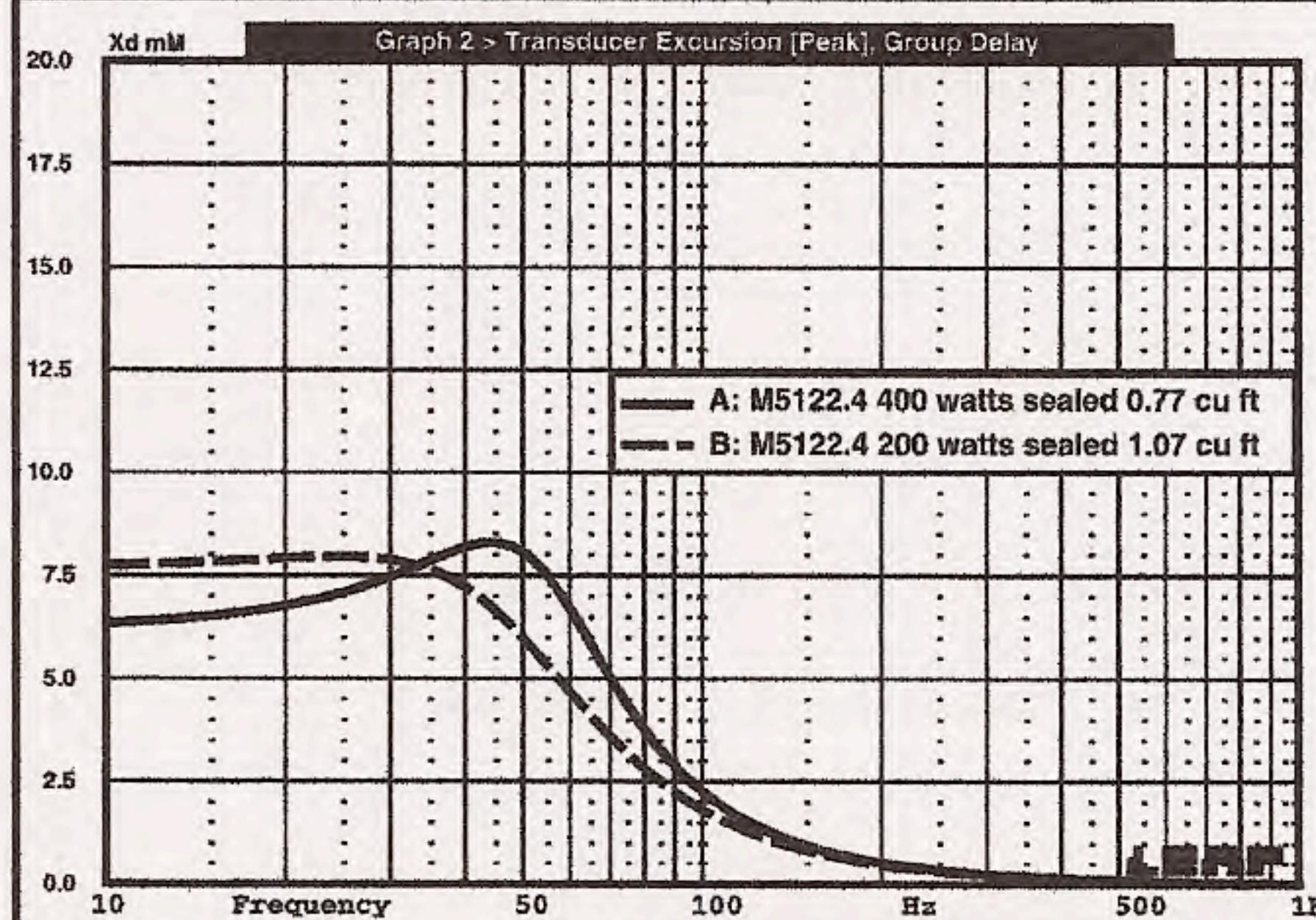
**System B** (200watts, larger) handles less power. Its  $Q_{tc}=.475$  (flatter response) is better suited to Classical music and Jazz.

GRAPH 1 - SPL



**Graph 1:** System A (400w, 0.77 cu. ft. gross) and System B (200w, 1.07 cu.ft.gross) are at the large and small extremes of our recommended box sizes but still have similar frequency response curves. The main point is to adjust box size to amplifier power so that BOTH higher and lower powered systems reach the same safe operating peak X-max. (see Graph 2)

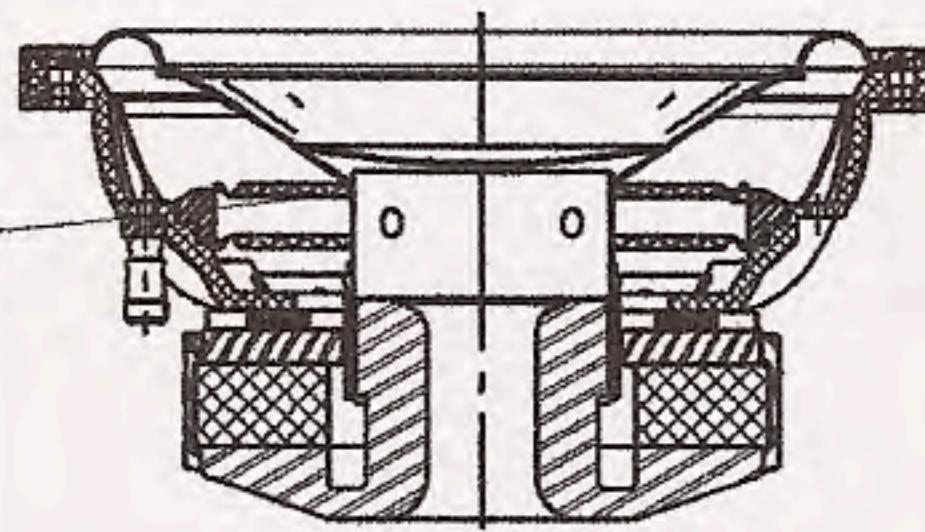
GRAPH 2 - X-MAX



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## THIELE / SMALL PARAMETERS

Parameter	Value	Unit
Fs	29	Hz
Vas	49	Liter
Cms	0.122	mm/N
Xmax	9	mm
Xmech	10.35	mm
Sd	0.053	m <sup>2</sup>
Re	3	ohms
Z	4	ohms
Pe	400	Watts
Qts	0.34	
no	0.316	%
SPL@1W	87.2	dB
SPL@2.83V	91.46	dB



## CHOOSING BOX VOLUME

Use your amplifier's rated output at the impedance represented by your subwoofer configuration to find the ideal gross enclosure volume on the chart below.

IDEAL POWER RANGE	POWER APPLIED	GROSS VOLUME
450W	400w	0.75Ft <sup>3</sup>
350W		0.8Ft <sup>3</sup>
300W		0.9Ft <sup>3</sup>
250W		0.95Ft <sup>3</sup>
200W		1.05Ft <sup>3</sup>
150W		1.1Ft <sup>3</sup>
100W		1.2Ft <sup>3</sup>

## SYSTEM A 400W - 0.77Ft<sup>3</sup>

- High power
- Better choice for Rap, Rock, and SPL

Vb	0.768	Ft <sup>3</sup> (gross)
Driver Disp.	0.168	Ft <sup>3</sup>
Net Vb	0.6	Ft <sup>3</sup> (net)
Qtc	0.55	
QL	7	
F3	42	Hz
Loosely fill 60%		

Material	- 3/4" MDF
External Dimensions	(motor in box) 15" x 14" x 9.25"
Internal Dimensions	13.5" x 12.5" x 7.75"

## SYSTEM B 200W - 1.07FT<sup>3</sup>

- Less power, lower, flatter response
- Better choice for Classical, Jazz, and Sound Quality

Vb	1.068	Ft <sup>3</sup> (gross)
Driver Disp.	0.168	Ft <sup>3</sup>
Net Vb	0.9	Ft <sup>3</sup> (net)
Qtc	0.475	
QL	7	
F3	44	Hz
Loosely fill 60%		

Material	- 3/4" MDF
External Dimensions	(motor in box) 15" x 14" x 11.35"
Internal Dimensions	13.5" x 12.5" x 9.85"

**CAUTION:**

Prolonged exposure to sound pressure levels in excess of 100dB has been shown to contribute to permanent hearing loss and tinnitus. Diamond's high performance speakers can exceed this level. Please exercise restraint in their operation.

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AUDIO TECHNOLOGY****Head Office**

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**LIMITED WARRANTY STATEMENT**

Diamond Audio Technology, Inc. (DAT) warrants all DAT products to be free of defects in material and workmanship for a period of one (1) year from the date of original purchase provided they are purchased from an authorized DAT retailer in the United States. However, the effective warranty period will be three (3) years if the products were purchased from and installed by an authorized DAT retailer.

**What is covered:** Parts and labor to effect repair or, at the sole discretion of DAT, replacement of either any malfunctioning or defective part(s) or the entire system should the system or any component part(s) thereof fail to perform as designed. Includes return freight via ground transportation to destinations within the United States.

**What is NOT covered:** Installation or setup and repair or replacement of the system or any parts thereof which, in DAT's judgment, fail or become damaged as a result of negligence, improper use, abuse, unauthorized modification or service, improper or inadequate packaging during shipment, installation by a non-authorized dealer, accident, or use for any purpose other than those for which this product was originally intended, or where the model's serial number has been removed, altered or defaced.

**Who is covered:** Original purchaser so long as they reside in the United States and can provide proof of the original date of purchase (e.g., store receipt) from an authorized DAT retailer.

**OUTSIDE THE UNITED STATES:** Customers outside the United States should contact their local sales office to obtain information on prices, exchange unit availability, instructions, service and warranty/non-warranty repairs.

Repair or replacement under this warranty is the exclusive remedy of the consumer. DAT shall not be liable for any incidental or consequential damages for breach of any expressed or implied warranty on this product. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose on this product is limited in duration to the duration of this warranty. Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights that may vary from state to state.

**How to obtain warranty service:** In the event a DAT product should require servicing, you should (a) visit an authorized DAT retailer or (b) call the DAT Service Dept. at (310) 838-8750. To be eligible for warranty service within a three (3) year period, the accompanying receipt of original purchase from an authorized DAT retailer must specifically note that dealer installation was provided.

**Product returned for repair/service must be properly packaged and clearly marked with the Return Authorization (RA) number issued by DAT. If the RA number is not clearly marked on the package or no RA number was issued by DAT, the product may be refused upon delivery. DAT does not assume responsibility for lost or misdirected product.**

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